Building America Case Study
Whole-House Solutions for New Homes

Grupe

Carsten Crossings | Rocklin, CA

PROJECT INFORMATION

Construction: New home

Type: Single-family

Builder: Grupe, Stockton, CA

Size: 2,168-2,755 ft²

Price Range: $478,000 to $528,000

Date Completed: 2007

Climate Zone: Hot-Dry, IECC 3B

Team: CARB

PERFORMANCE DATA

HERS Index: 54 to 62 without PV

Projected annual energy cost savings: $1,528

Added first cost of efficiency measures: $25,000

Annual mortgage increase: $158

Annual net cash flow to homeowner: $1,370

Billing data: Grupe $89/month vs. code construction $189/month

In the volatile California housing market, energy efficient construction has helped Stockton area home builder Grupe to stand out from the competition. The production builder's 144-home Carsten Crossings in Rocklin, CA, outsold the competition two to one in a very tough Sacramento home market. "The zero energy features of these homes definitely helped us close deals," said Mark Fischer, a senior vice president at Grupe.

Grupe sold 23 of its first 30 homes in the first three months, even though the market in Sacramento was very slow in 2006 when the first homes came on the market at Grupe's Carsten Crossings project.

Carsten Crossings home owners have seen utility savings of 40% to 80% per month compared to comparably sized homes built to California's Title 24, thanks to both the photovoltaics and an impressive mix of energy-efficient measures that were offered as standard features by Grupe.

Building America's Consortium for Advanced Residential Buildings (CARB) team, led by Davis Energy Group, has helped Grupe on several aspects of the project, including selecting energy-efficiency measures, preparing bid specifications for the photovoltaic system, testing and inspections during construction, and post-construction analysis. Davis also helped develop educational materials for staff and the public.

Grupe chose a photovoltaic product that was similar in size to a row of concrete roofing tiles. Rather than sitting on top of the roof like traditional solar panels, these integrated solar tiles are used in place of some of the roofing tiles, in an overlapping pattern that blends in with the surrounding roofing materials.

At Carsten Crossings, the heating and cooling system ducts were wrapped, sealed, and buried in R-49 of blown cellulose insulation.

(Photo top left) Despite a very slow housing market, Grupe sold 144 energy-efficient homes at Carsten Crossings in Rocklin, California, twice as fast as its competitors.

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Grupe chose a photovoltaic product that mimics the size and shape of cement roof tiles, integrating seamlessly with the roofing.

KEY ENERGY-EFFICIENCY MEASURES

HVAC:

- 90% AFUE variable speed furnace
- Ducts buried in attic insulation
- SmartVent night ventilation cooling
- "FreshVent" continuous ventilation

Envelope:

- R-49 blown cellulose, vented attic
- Blown fiberglass in 2x4 wall cavities plus 1-inch R-5 rigid foam sheathing
- Double-pane, low-e, vinyl-framed windows
- Tightly sealed house, 2.5ACH50

Lighting, Appliances, and Water Heating:

- ENERGY STAR® dishwasher and lighting
- 2.4 kw integrated roof-tile photovoltaic system
- Tankless gas hot water heater with home-run manifold piping

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The attic ceilings were lined with a radiant barrier to reflect heat. The 2x4 stud walls were filled with blown-in fiberglass or soy-based foam insulation. In addition, all of the homes' exterior walls were blanketed with a 1-inch layer of rigid foam for additional insulation.

Lessons Learned

- Grupe chose to make solar a standard feature on all 144 houses. "Our experience on previous projects has been that very few homeowners purchase solar photovoltaics when it is offered as an option. Grupe was able to negotiate a much better deal with their contractors by making it standard across the project," said David Springer of Davis Energy Group.
- Grupe found that energy-efficient construction can be a great selling tool if sales staff know how to use it. Grupe conducted 4 hours of formal training for all of its sales staff, followed by ongoing training. To further the learning experience, Grupe turned the garage of one of its model homes into an energy efficiency and solar show room for training sales staff and educating potential buyers. They also conducted media outreach, like holding press conferences and putting together a GrupeGreen DVD.
- To cut cooling costs, the homes used a SmartVent automatic night ventilation cooling system developed by Davis Energy Group. The system uses a thermostat-controlled damper to let in cool, filtered air when the outdoor temperature drops at night. A study of SmartVent's effectiveness conducted on another project by PG&E showed average daily energy savings of 22% and peak demand reduction of 42% when temperatures were 104°F or higher and average daily energy savings of 16.3% overall and 48% peak demand reduction on days when the temperatures reached 92°F.
- Grupe compared its sales rate to that of eight competitors selling similar sized, just-to-code homes in 2006 and 2007. The competitors were selling at an average rate of 1.9 homes per month. Grupe sold at a rate of 4.6 homes per month, selling all 144 homes in 31 months, about 45 months sooner than it would have at its competitor's rate.

"Be prepared to train your whole organization on why it's a good deal, especially sales staff. They have to be able to tell potential buyers why zero energy construction is so great."

Mark Fischer, senior vice president, Grupe Homes

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